

Appl. No. 10/603,888  
Amdt. dated August 3, 2006  
Reply to Office Action of April 7, 2006

**PATENT**

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings of claims in the application:

**Listing of Claims:**

1 Claim 1. (currently amended) A device comprising:  
2 an I/O connection having a plurality of independently configurable attributes,  
3 wherein the I/O connection is adapted to communicate an I/O value and having a configurable  
4 attribute;  
5 a configuration memory adapted to store a first attribute value that configures at  
6 least one the configurable attribute from the plurality of configurable attributes;  
7 a diagnostic interface adapted to communicate the I/O value; and  
8 a diagnostic controller having a first mode adapted to communicate the I/O value  
9 between the I/O connection and the diagnostic interface and having a second mode adapted to  
10 receive the first attribute value from the diagnostic interface and to store the received first  
11 attribute value in the configuration memory, ~~thereby configuring the configurable attribute of the~~  
12 ~~I/O connection~~ wherein the at least one configurable attribute of the I/O connection is  
13 configured by the first attribute value.

1 Claim 2. (currently amended) The device of Claim 1, wherein the second mode is  
2 further adapted to read a second attribute value previously stored in the configuration memory  
3 and to send the second attribute value to the diagnostic interface, wherein the second attribute  
4 value previously configured the at least one configurable attribute.

1 Claim 3. (original) The device of Claim 1, wherein the configuration memory is  
2 further adapted to store a second attribute value that configures a second configurable attribute;  
3 and wherein the second mode of the diagnostic controller does not store the second attribute  
4 value in the configuration memory, wherein the second configurable attribute is unassociated  
5 with the I/O connection.

**Best Available Copy**

**Best Available Copy**

Appl. No. 10/603,888  
Amdt. dated August 3, 2006  
Reply to Office Action of April 7, 2006

PATENT

1 Claim 4. (original) The device of Claim 3, wherein the configuration memory  
2 comprises a I/O configuration memory adapted to store the first attribute value and a core  
3 configuration memory adapted to store the second configurable attribute value.

1 Claim 5. (original) The device of Claim 2, wherein the I/O configuration memory  
2 comprises a shift register adapted to shift in and store the first attribute value and to shift out and  
3 output the second attribute value.

1 Claim 6. (original) The device of Claim 1, wherein the diagnostic interface  
2 comprises a serial data connection.

1 Claim 7. (original) The device of Claim 6, wherein the serial data connection is  
2 adapted to receive a second I/O value from an I/O connection of a second device and to send the  
3 second I/O value to a third device.

1 Claim 8. (original) The device of Claim 7, wherein the diagnostic interface is a  
2 JTAG interface.

1 Claim 9. (original) The device of Claim 1, further comprising:  
2 a configuration interface adapted to receive a set of attribute values for a set of  
3 configurable attributes of the device from a configuration device; and  
4 a configuration controller adapted to store the set of attribute values in the  
5 configuration memory, thereby configuring the set of configurable attributes of the device.

1 Claim 10. (currently amended) The device of Claim 9, wherein the set of  
2 attribute values include a second attribute value configuring the configurable attribute of the I/O  
3 connection;

1 Claim 11. (original) The device of Claim 9, wherein the second mode of the  
2 diagnostic controller disables the configuration controller.

Appl. No. 10/603,888  
Amdt. dated August 3, 2006  
Reply to Office Action of April 7, 2006

PATENT

1 Claim 12. (original) The device of Claim 9, wherein the configuration controller  
2 is further adapted to receive a signal and to retrieve the set of attribute values in response to the  
3 signal.

1 Claim 13. (original) The device of Claim 12, wherein the signal is received from  
2 a source external to the device.

1 Claim 14. (original) The device of Claim 12, wherein the signal is received from  
2 the diagnostic controller.

1 Claim 15. (original) The device of Claim 14, wherein the diagnostic controller  
2 further includes a third mode for receiving a configuration instruction from the diagnostic  
3 interface and generating the signal in response to the configuration instruction.

1 Claim 16. (original) The device of Claim 15, wherein the diagnostic controller  
2 further includes a pulse generator for generating the signal.

1 Claim 17. (original) The device of Claim 1, wherein the device is an integrated  
2 circuit.

1 Claim 18. (original) The device of Claim 1, wherein the device is a  
2 programmable logic device.

1 Claim 19. (original) The device of Claim 1, further comprising:  
2 a system having a plurality of devices connected with the device.

1 Claim 20. (original) The device of Claim 19, wherein the system further includes  
2 a configuration device.

1 Claim 21. (original) The device of Claim 1, further comprising:  
2 a circuit board having a plurality of additional devices mounted thereto, such that  
3 the device is connected with at least one other device on the circuit board.

Appl. No. 10/603,888  
Amdt. dated August 3, 2006  
Reply to Office Action of April 7, 2006

PATENT

1 Claim 22. (original) The device of Claim 21, wherein the circuit board further  
2 includes a configuration device.

1 Claim 23. (currently amended) A device comprising:  
2 an I/O connection that is reconfigurable with respect to a plurality of configurable  
3 attributes and adapted to communicate an I/O value;  
4 a set of configurable attributes defining the function of the device and  
5 configuration of the I/O connection;  
6 a configuration memory adapted to store the set of attribute values configuring the  
7 configurable attributes;  
8 a configuration interface adapted to receive the set of attribute values from a  
9 configuration device; and  
10 a configuration controller adapted to store in the configuration memory the set of  
11 attribute values received by the configuration interface in response to a configuration signal;  
12 ~~thereby configuring the set of configurable attributes of the device wherein the set of attribute~~  
13 values configure the set of configurable attributes of the device and the I/O connection;  
14 a diagnostic interface adapted to communicate the I/O value of the I/O  
15 connection; and  
16 a diagnostic controller having a first mode adapted to communicate the I/O value  
17 between the I/O connection and the diagnostic interface and having a second mode adapted to  
18 send the configuration signal to the configuration controller.

1 Claim 24. (original) The device of Claim 23, wherein the diagnostic controller is  
2 further adapted to receive the configuration instruction from the diagnostic interface and to send  
3 the configuration signal to the configuration controller in response to the configuration  
4 instruction.

1 Claim 25. (original) The device of Claim 23, wherein the diagnostic controller  
2 further includes a pulse generator for generating the configuration signal.

Appl. No. 10/603,888  
Amdt. dated August 3, 2006  
Reply to Office Action of April 7, 2006

PATENT

1                   Claim 26. (original) The device of Claim 23, wherein the configuration  
2 controller is further adapted to receive the configuration signal from a source external to the  
3 device.

1                   Claim 27. (original) The device of Claim 23, wherein the device is an integrated  
2 circuit.

1                   Claim 28. (original) The device of Claim 23, wherein the device is a  
2 programmable logic device.

1                   Claim 29. (currently amended) A method for configuring an attribute of an I/O  
2 connection of a reconfigurable device comprising:  
3                   receiving a diagnostic instruction from a diagnostic interface;  
4                   communicating an I/O value from the I/O connection to the diagnostic interface  
5 when the diagnostic instruction is of a first type;  
6                   receiving an attribute value from a plurality of attribute vales associated with the  
7 attribute of the I/O connection from the diagnostic interface when the diagnostic instruction is of  
8 a second type; and  
9                   storing the attribute value in a configuration memory, ~~thereby configuring the I/O~~  
10 ~~connection, wherein the I/O connection is configured from a first state to a second state in~~  
11 response to the attribute value when the diagnostic instruction is of the second type.

1                   30. (original) The method of Claim 29, wherein storing the attribute value  
2 comprises:  
3                   shifting the attribute value into a shift register;  
4                   shifting a previously stored attribute value of the I/O connection out of the shift  
5 register; and  
6                   communicating the previously stored attribute value with the diagnostic interface.

Appl. No. 10/603,888  
Amdt. dated August 3, 2006  
Reply to Office Action of April 7, 2006

PATENT

1                   Claim 31. (original) The method of Claim 29, wherein the diagnostic interface  
2 comprises a serial data connection.

1                   Claim 32. (original) The method of Claim 29, wherein the diagnostic interface is  
2 a JTAG interface.

1                   Claim 33. (original) The method of Claim 29, further comprising:  
2                   receiving a configuration signal via the diagnostic interface;  
3                   retrieving a set of attribute values defining the function of the reconfigurable  
4 device from a configuration device via a configuration interface in response to the configuration  
5 signal; and  
6                   storing the set of attribute values in the configuration memory, thereby defining  
7 the function of the reconfigurable device.

1                   Claim 34. (original) The method of Claim 33, wherein the set of attribute values  
2 includes a second attribute value associated with the attribute of the I/O connection.

1                   Claim 35. (original) The method of Claim 33, wherein receiving the  
2 configuration signal, retrieving the set of attribute values, and storing the set of attribute values  
3 are disabled when the diagnostic instruction is of the second type.

1                   Claim 36. (currently amended) A system having a plurality of devices, the system  
2 comprising:  
3                   a reconfiguration device having a stored set of device attributes;  
4                   a reconfigurable device having a set of configurable attributes and adapted to  
5 receive the stored set of device attributes, thereby configuring the reconfigurable device; and  
6                   a diagnostic interface adapted to interface with the reconfigurable device and with  
7 an external testing device, thereby communicating an I/O value associated with an I/O  
8 connection of the reconfigurable device to the external testing device, wherein the I/O  
9 connection is reconfigurable in response to one or more of the stored set of device attributes;

Appl. No. 10/603,888  
Amdt. dated August 3, 2006  
Reply to Office Action of April 7, 2006

PATENT

10 wherein the reconfigurable device includes a configuration controller adapted to  
11 initiate the reception of the stored set of device attributes in response to a configuration signal,  
12 and a diagnostic controller having a first mode adapted to communicate the I/O value between  
13 the I/O connection and the diagnostic interface and having a second mode adapted to send the  
14 configuration signal to the configuration controller, wherein the I/O connection is reconfigured  
15 in response to at least one of the device attributes.

1 Claim 37. (original) The system of Claim 36, wherein the diagnostic controller is  
2 further adapted to receive from the diagnostic interface a second set of device attributes adapted  
3 to configure the reconfigurable device.

1 Claim 38. (original) The system of Claim 36, wherein the diagnostic controller is  
2 further adapted to send the configuration signal to the configuration controller in response to a  
3 configuration instruction received from the diagnostic interface.

1 Claim 39. (original) The system of Claim 36, wherein the configuration  
2 controller is further adapted to receive the configuration signal from a source external to the  
3 device.

Claim 40. (original) The system of Claim 36, wherein the diagnostic interface is  
a JTAG interface.